

**From:** [Nickel, Brian](#)  
**To:** [Scott Fields](#)  
**Subject:** RE: Ramsdell field measurements "with channel data" (and velocity)  
**Date:** Wednesday, October 21, 2020 3:32:00 PM

---

Scott:

You're welcome. I have one minor correction: the correct TSD section reference is 4.3.3 (not 4.3.2).

Thanks,

Brian Nickel, E.I.T.

Environmental Engineer

US EPA Region 10 | Water Division | NPDES Permits Section

Voice: 206-553-6251 | Toll Free: 800-424-4372 ext. 6251 | Fax: 206-553-1280

[Read my blog](#)

[Nickel.Brian@epa.gov](mailto:Nickel.Brian@epa.gov)

<https://www.epa.gov/npdes-permits/about-region-10s-npdes-permit-program>

*Please conserve natural resources by not printing this message.*

---

**From:** Scott Fields <[sfields@cdatribe-nsn.gov](mailto:sfields@cdatribe-nsn.gov)>

**Sent:** Monday, October 19, 2020 3:02 PM

**To:** Nickel, Brian <[Nickel.Brian@epa.gov](mailto:Nickel.Brian@epa.gov)>

**Subject:** RE: Ramsdell field measurements "with channel data" (and velocity)

Brian thank you for taking a further look into this. Looking at the spreadsheet you provided I believe you have applied Section 4.3.2 of the TSD correctly using these updated river velocities.

With this new analysis I think you should proceed with calculating their water quality targets for the permit.

Thanks for all your hard work on this.

Scott Fields

Water Resource Program Manager

Coeur d'Alene Tribe

Ph. (208) 686-0252

Fax (208) 686-7221

[sfields@cdatribe-nsn.gov](mailto:sfields@cdatribe-nsn.gov)

---

**From:** Nickel, Brian <[Nickel.Brian@epa.gov](mailto:Nickel.Brian@epa.gov)>

**Sent:** Tuesday, October 13, 2020 1:32 PM

**To:** Scott Fields <[sfields@cdatribe-nsn.gov](mailto:sfields@cdatribe-nsn.gov)>

**Subject:** RE: Ramsdell field measurements "with channel data" (and velocity)

**Warning**

**This email is from an external source: Please DO NOT open links or attachments from untrusted senders!**

Scott:

I've repeated the modeling for velocities from 0.01 – 0.05 ft/s. The results are summarized in the attached spreadsheet.

- The widths in column C are not realistic; they're artificially scaled so that I could adjust the velocity but keep the river flow equal to the 7Q10 (258 CFS) and also keep the local depth of the river near the outfall accurate based on PotlatchDeltic's measurements.
- Column D lists the downstream distance necessary to achieve a dilution factor of 19.4:1, which is the acute dilution factor used in the preliminary draft permit (25% of the 1Q10 river flow).
- Columns E and F list the travel time necessary to achieve a dilution factor of 19.4:1 in seconds and minutes, respectively. As you can see, it takes at least 34 minutes to achieve this dilution factor.
- Column G lists the dilution factor achieved after 15 minutes of plume travel, if I could discern that from the Cormix output. For some of the low ambient velocity runs, I could not do that, because, after 15 minutes of travel time, the plume was exhibiting upstream spreading. Because of the way Cormix reports output within the portion of the plume exhibiting this behavior, I can't pin down a dilution factor at a particular point in time. In those cases, the value in column G is "N/A."
- Column H lists the downstream distance at which the chronic dilution factor used in the preliminary draft permit (38.9:1, based on 25% of the 7Q10 flow) is achieved. This is one measure of the size of the chronic mixing zone. I need to define the size of the chronic mixing zone so that Cormix can determine whether or not the acute mixing zone is within 10 percent of the distance from the edge of the outfall structure to the edge of the chronic mixing zone in any spatial direction, which is one of the criteria for sizing an acute mixing zone in Section 4.3.2 of the Technical Support Document for Water Quality-based Toxics Control (TSD). Note that this has the effect of shrinking the acute mixing zone (and the acute dilution factor) in cases where the chronic dilution factor is achieved relatively close to the outfall.
- Column I lists the dilution factors for an acute mixing zone that meets all of the criteria for sizing such a mixing zone in Section 4.3.2 of the TSD.

The worst case (lowest) acute dilution factor in the summer was 1.48:1, which is the result for the 0.02 ft/s ambient velocity scenario. For the winter, it was 4.3:1, which is the result for the 0.01 ft/s ambient velocity scenario. As I mentioned, I think a bulk or average velocity of 0.01 ft/s is unrealistic, but the local ambient velocity at the point of discharge could be lower than the bulk velocity.

Thanks,

Brian Nickel, E.I.T.

Environmental Engineer

US EPA Region 10 | Water Division | NPDES Permits Section

Voice: 206-553-6251 | Toll Free: 800-424-4372 ext. 6251 | Fax: 206-553-1280

[Nickel.Brian@epa.gov](mailto:Nickel.Brian@epa.gov)

<https://www.epa.gov/npdes-permits/about-region-10s-npdes-permit-program>

*Please conserve natural resources by not printing this message.*

---

**From:** Nickel, Brian

**Sent:** Thursday, October 08, 2020 4:34 PM

**To:** [sfields@cdatribe-nsn.gov](mailto:sfields@cdatribe-nsn.gov)

**Subject:** Ramsdell field measurements "with channel data" (and velocity)

Scott:

As discussed, here's the USGS field measurements at Ramsdell. This link should display it "with channel data," which includes velocity values. They only provide a single velocity value for each measurement. You can click the "Channel vel. (ft/s)" column header to sort by velocity. The "VADCP" velocity method means they used an acoustic doppler current profiler.

[https://waterdata.usgs.gov/id/nwis/measurements?site\\_no=12415135&agency\\_cd=USGS&format=html\\_table\\_expanded](https://waterdata.usgs.gov/id/nwis/measurements?site_no=12415135&agency_cd=USGS&format=html_table_expanded)

Note that the stream flow associated with the lowest velocity of 0.01 ft/s (on 9/1/2017) was only 68.1 CFS, which is less than the 1-day, 10-year low flow for this station (125 CFS), but there are several velocities in the range of 0.02 – 0.05 ft/s. I'll do some more model runs at ambient velocities in that range to see how that influences the mixing.

Thanks,

Brian Nickel, E.I.T.

Environmental Engineer

US EPA Region 10 | Water Division | NPDES Permits Section

Voice: 206-553-6251 | Toll Free: 800-424-4372 ext. 6251 | Fax: 206-553-1280

[Nickel.Brian@epa.gov](mailto:Nickel.Brian@epa.gov)

<https://www.epa.gov/npdes-permits/about-region-10s-npdes-permit-program>

*Please conserve natural resources by not printing this message.*